L'hermitte, and others in France, and Hurst in this country, Sollier declares that the "reflex" or "physiopathic" cases described by Babinski and Froment are easily curable by mobilisation and psychotherapy. The muscular and vaso-motor changes, etc., are believed to be entirely due to immobility, and clear up as soon as the use of the affected limb is restored. A return to Charcot's conception of hysteria is predicted by Sollier as the result of war experiences. Careful distinction is made between true reflex contractures associated with pain, and those called "reflex" by Babinski and Froment. All varieties of functional disorder, including those of the special senses, are described. Treatment by mobilisation and isolation is recommended, while the exclusion of splints, massage, electrotherapy, etc., is urged.

The section which deals with re-education is instructive. The organisation of the re-education treatment seems to have been excellent. The early individual treatment by the physician is succeeded by exercises under a masseur, who is himself carefully supervised by the physician. The next stage is that of gymnastic drill under medical supervision, in which chosen N.C.O.'s and patients assist. Finally, uncontrolled military drill completes the "hardening process" to fit the soldier for military duty. The use of carefully supervised physical work, as in our own "curative workshops," and of games, also forms part of the routine.

The value of mechano-therapy is contrasted with that of motor re-education, to the great advantage of the latter, which is found to be an active, living mode of treatment when crowned by curative work.

(2) The authors publish in this volume the results of their careful studies of tissues damaged by war wounds. They have been able to make parallel observations upon the tissue cells and the bacterial flora of wounds, so that much useful information is available. The deductions that they have drawn from the various changes found are clearly expressed, and a fearless criticism of the recent antiseptic methods of wound treatment is made.

The opening section is devoted to a description of the lesions, emphasis being laid upon the important part played by damaged muscle as a culture medium for bacteria. The process of myolysis by ferments is described, and stress is laid upon the fact that the simple protein bodies resulting from the process, viz. peptones and amino-acids, favour bacterial growth to a greater degree than do the albumins. During the first four to twelve hours after the trauma the infection is little marked, and at this period such a wound might be capable of transformation into a surgical wound with union by first intention.

In the nature of the infection an important place is given to the anaerobes. The bacillus of malignant œdema (*vibrion septique*), bacillus aerogenes capsulatus (*B. welchii*), with the whole series of anaerobes, obtain the expected recognition in the description of the infection. The aerobic organisms appear in wounds after the anaerobic series has been observed for some hours previously. The streptococcus is found to be the most dangerous of the aerobic series, especially in the usual state of mixed infection, when proteolytic changes greatly favour its growth. The defence in all its aspects is fully and clearly discussed.

Leucocytic changes as seen by vital staining methods, serum reactions, antitoxins, and ferment actions are all included in the study of the defence mechanism. The changes which result in the breakdown of the defence, and the production of gas gangrene, are fully dealt with, and emphasis is laid upon the fact that the nature of the infection rather than bacterial quantity is the important factor with which the tissue cells have to deal.

The section on therapeutics mentions every known means of meeting infection, and each measure is fully criticised. As a result of their wide researches, especially those directed to the study of infected excised tissues, the authors urge that the best treatment for war wounds is the early excision of all damaged tissue, followed by primary suture. The authors insist upon the early work of Gaudier in October, 1915, in connection with wound incision, and they claim that, as 85 per cent. of the wounds can be safely excised and sutured, other treatment, such as irrigation with antiseptics, is superfluous.

The action of chemical agents is carefully analysed until their futility is obvious. The Carrel-Dakin technique is severely handled by the authors, the solution itself being characterised as a "chemical bistoury which acts by proteolysis of mortified tissue." The general therapeutic conclusions are that damaged tissues and their infection play the most important part in war wounds. Excision of lacerated muscle, etc., and the conversion of the wound into an ordinary surgical wound, are the greatest advances in wound treatment. Local treatment is most important, although general measures, such as vaccines and sera, may help in selected cases.

J. LE FLEMING BURROW.

THE FACE OF THE EARTH.

La Face de la Terre (*Das Antlitz der Erde*). Par Prof. Ed. Suess. Traduit de l'Allemand avec l'Autorisation de l'Auteur et Annoté sous la Direction de Emm. de Margerie. Tome iii., 4e Partie. (Fin.) Avec un Epilogue par P. Termier. Pp. xvi+1361–1724. Tables Générales de l'Ouvrage. Tomes i., ii., iii. (1re, 2e, 3e et 4e Parties.) (Paris: Librairie Armand Colin, 1918.) Price 25 francs.

THIS is a noble ending to a noble work. On the merits of the original it is scarcely necessary to enlarge; since they were first recognised in these pages they have become familiar to all English geologists, and the fame of "Das Antlitz" has spread over the whole world. Yet time has increased, rather than diminished, our appreciation of its great qualities, and we take advantage of this opportunity to express our admiration for its superb mastery over detail and the acute vision which have combined to give us in true perspective so many faithful pictures of terrestrial structure; for its power of synthesis, discovering in the midst of the most diverse phenomena an underlying unity; for its freshness of explanation, always surprising us with novel theories and hypotheses; and for many bold conceptions, which, whether we accept them or not, are always valuable for what they suggest if for nothing else. The delight with which we follow the author through the most complicated descriptions or discussions is increased by the vigour of his language, with its occasional ascent into spontaneous eloquence under the inspiration of great ideas. As we read, we are conscious of a new spirit which has broken loose from ancient dogmas and leads us forth to fresh conquests of the unknown.

It was the French geologists who were the first to welcome the appearance of the new geology and undertook the translation of "Das Antlitz" into their language under the direction of M. Emmanuel de Margerie. The first volume of "La Face de la Terre" appeared in 1897; it opens with a thoughtful and appreciative preface by Marcel Bertrand. The last part was published last year (1918). It fitly concludes with an eloquent eulogy by M. Pierre Termier.

"La Face de la Terre" is an improvement on the original. As a translation it is absolutely faithful, and in the hands of masters of French prose like M. de Margerie and his colleagues, it gains by the added grace and lucidity which are inseparable from the French language. But it is much more than a translation; by the addition of numerous footnotes and illustrations it becomes a new edition.

The added illustrations are particularly welcome, those of the original work being wholly inadequate. Suess, when he wrote his masterly descriptions, had a mass of material, maps, sections, and drawings before his eyes, but, limited probably by considerations of expense, he introduced only 168 figures into the text. The French have given us more than thrice this number (in all 552 figures), and yet without greatly increasing the price. Even with this wealth of illustration we are not content, and still ask for more, especially for a few simple diagrams which would enable us to grasp with greater facility some of the new conceptions with which the work abounds.

The added notes, which are distinguished from those in the original by square brackets, are of great value; they bring the bibliographical references up to date, and when necessary point out how far the author's conclusions must be modified in the light of later knowledge.

The English translation, which was commenced (in 1904) much later than the French, and completed, so far as the body of the work is concerned, much earlier (in 1908), contains no new matter. We may hope that it will be supplemented by an atlas at some future date; meanwhile the student must have recourse to the French edition. That the English translation does not yet possess an index is a consequence of the war; the MS. has been in the hands of the printers for many years past.

The last part of the third volume of "La Face de la Terre," which is the immediate subject of this review, fully maintains the high standard of its predecessors. The first chapter, entitled "Analysis," presents us with an admirable survey of the structural features of mountain chains as revealed by a long series of brilliant investigations, which, begun long ago by Lapworth, were continued by Peach and Horne at home, and by numerous observers abroad, among whom Bertrand and Lugeon are pre-eminent. What a surprising revolution has been accomplished in our knowledge will be understood at a glance if we turn to the section across the Alps represented in Fig. 340 on p. 1448, where we are shown how the accumulated sediments of ancient seas have been transported in successive flows which have carried them many miles from their source and repeatedly doubled them one over the other in long, flat-lying folds. A satisfactory explanation of this phenomenon is still to seek; theory is completely outdistanced by observation.

The next chapter, entitled "The Depths," casts a penetrating glance into the interior of the earth and throws light on the various forms of igneous activity within the crust. A chapter on "The Origin and Distribution of Volcanoes" follows; it includes a brief account of the diamond pipes of South Africa. Then comes a chapter on "The Moon: Various Hypotheses and a Retrospect." In this we meet with some valuable suggestions on the question of isostasy. The illustrations added in the French edition are nowhere more welcome than in this place. The discussion of isostasy involves, however, mathematical treatment with which Suess does not seem to have been familiar, otherwise he would have scarcely proposed to neglect that factor in the reduction of observations which is commonly known as the Bourgeur correction, for, as Col. Lenox Conyngham has remarked, such a proposal is equivalent to asserting that it makes no difference whether the pendulum observations were made on a lofty tableland or in a balloon poised at the same altitude over a plain at sea-level.

The last chapter, "La Vie," is devoted to many interesting reflections on sundry problems concerned with the history of life on the globe, the migrations of faunas, and the preservation, amidst the revolutions of land and sea, of living beings in places of refuge or "asylums," the situation of which and their geological characters afford interesting material for discussion.

In concluding, we would ally ourselves with M. Termier in his admiration for this monumental treatise and, adopting as nearly as possible his own words, we may say: "Such a work is destined to endure, not for an age, but for all time. If it grows old it does so only very slowly, and preserves in its old age the majesty and beauty of things imperishable." W. J. SOLLAS.

PHYSIOLOGICAL CHEMISTRY.

(1) *Fats and Fatty Degeneration: A Physico-Chemical Study of Emulsions and the Normal and Abnormal Distribution of Fat in Protoplasm.* By Prof. Martin H. Fischer and Dr. Marian O. Hooker. Pp. ix+155. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1917.) Price 9*s*. 6*d*. net.

(2) *Practical Physiological Chemistry.* By Sydney W. Cole. Fifth edition. With an introduction by Prof. F. G. Hopkins. Pp. xvi+401. (Cambridge: W. Heffer and Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd., 1919.) Price 15*s*. net.

(1) LIKE Prof. Fischer's earlier studies on œdema and nephritis, this work on fatty degeneration and allied topics is suggestive and stimulating, but unsatisfactory. As before, we have, in the first place, a study of phenomena produced *in vitro*, in this case on the formation of various types of emulsion and on the factors leading to their stabilisation or "breaking." The observations are of no particular novelty, but they are well arranged from the point of view of popular demonstration. Passing to the condition in which fat is held in the protoplasm of the normal cell, and of that which has become the subject of fatty degeneration, the authors emphasise, with justice, the fact that the latter may contain actually no more fat than the former. This consideration gives an opening to Prof. Fischer's predilection for facile analogy. The comparison between the appearance in obvious droplets of fat previously invisible, and the "breaking" of a fine emulsion, is obvious and suggestive. But the recognition of a superficial similarity is a long way from a scientific demonstration of identity. On the authors' own showing, it is difficult to see why the post-mortem development of acidity, which is far in excess of any which can occur during life, does not produce the appearance of extreme fatty infiltration in every cell submitted to histological examination.

The mimicry of mucous secretion, by the effect of water on an emulsion of powdered gum in oil, has about the same scientific value. But the method surely leads the authors beyond all permissible limits in the chapter on "The Mimicry of Some Anatomical Structures." The suggestion that a soap solution beaten to fine foam with air looks, under the microscope, "not unlike a microscopic section of lung," or that the figures produced in the drying of an oil-in-soap emulsion "remind one of the rods and cones of the retina," seems to be much on the same level as a child's discovery of trees in a frosted window-pane, or of animal forms in the clouds. Are the authors trying to play Hamlet to the reader's Polonius, or do they wish to be taken seriously?

(2) Mr. Cole's valuable book, after being out of print for more than a year, now reappears in a fifth edition, with extensive revision and additions. The new chapter on the properties of solutions contains a full account of the method of determining hydrogen-ion concentrations by means of standard solutions and the range of indicators now available. This, like many other items in the book, will be of value to workers in many departments of biological science in which quantitative chemical methods are required. The instructions for preparing collodion sacs for dialysis, in the same chapter, could be improved by including some of the technical advances made in recent years by Walpole and by Brown. A properly made membrane of this kind surely becomes impermeable rather than porous on drying.

A large part of the book is still devoted to quantitative methods, and these are described with admirable clarity of detail. While the range of alternative methods in some instances might be thought to overburden a student's course, it greatly enhances the value of the book to the worker in a clinical or research laboratory. There is internal evidence, in almost every description of a method, that the working has been confirmed by personal experience; the book abounds in those valuable hints and practical details which come only from actual trial, and the absence of which renders many a laborious compilation so unsatisfactory. The directions for preparing certain amino-acids may be mentioned as remarkably good in this way; and, since this chapter is admittedly beyond the scope of ordinary class-work, it may be hoped that Mr. Cole, in a future edition, will increase the obligation of those needing pure amino-acids for bacteriological and other work, by extending the list of preparations. H. H. D.

OUR BOOKSHELF.

L Insidia Sottomarina e Come fu Debellata, con Notizie sul Recupero delle Navi affondate. By Rear-Admiral E. Bravetta. Pp. vii+461. (Milan: Ulrico Hoepli, 1919.)

OF the hundreds of war-books published purporting to explain in a popular manner the work of the Allied Navies in tracking down and destroying U-boats, there are few, if any, which tell the public of the means adopted. Most books of the kind are merely suggestive, and much is left to the imagination. The present volume, by Admiral Bravetta, who is probably Italy's most distinguished writer on naval affairs, is far in advance of existing works of a similar kind.

So far as is permitted by reasons of military secrecy, Admiral Bravetta explains first of all the functions of the submarine, how this type of craft